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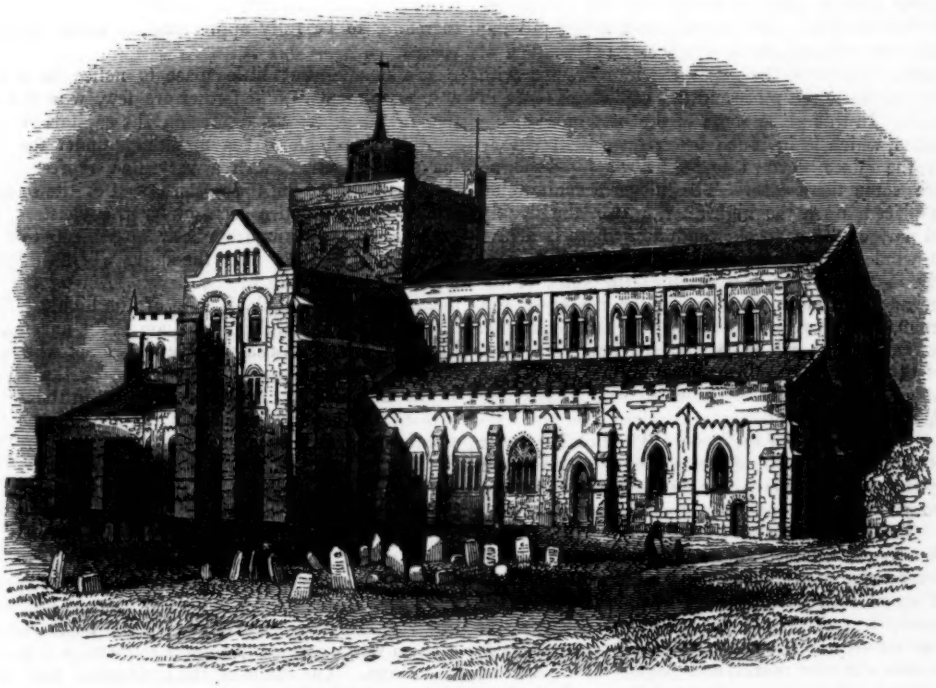
ROMSEY.



[The Abbey Church, Romsey, Hampshire.]

THE antient town of Romsey, *Romseige*, or *Romesege*, has more claims to attention and is better calculated to reward that attention than many other places of double the population. It is still of considerable magnitude as a country-town in an agricultural district, the population of the two parishes, Extra and Infra, being 5432, according to the census of 1831, which is an increase of 26 per cent. within the twenty years preceding. This is a little remarkable, because, during that time the last remains of its lingering woollen manufacture have gone, and the manufacture of paper, which once was considerable, is very greatly reduced. The only manufactures that it can now be said to have are those of parchment and other dressed skins; and the chief trade, besides the vending of these, is wool-stapling. The town is, however, situated in the middle of a rich agricultural district, upon the left bank of the little river Test, about ten miles from Winchester, fourteen from Salisbury, and eight from Southampton; and a great deal of business is done in the purchase of corn and the preparation of flour and malt.

Romsey Abbey was founded very early in the tenth century, and appears to have been richly endowed. It was a nunnery, and several members of the Saxon royal family were abbesses. The original buildings were totally destroyed by the Danes, and subsequently rebuilt. It is impossible to say what may have been the style of architecture in the Abbey, properly so called, because no part of it remains; the church, however, is Norman, as is evinced by its majestic height, and the bold mouldings and sculptures on the capitals. But while the buildings of the Abbey, the cloisters, and all that gave the place a monastic air, have been swept away, the church has been carefully preserved, and is one of the most spacious and elegant in the county.

The situation on which the church stands is commanding, and though its elevation above the irrigated meadows is not great, it is dry. Along the north there is the churchyard, and if beauty could be predicated of the last mansion of the dead, one would call it beautiful. On the west there is a pleasant little spot, tastefully laid out in grass and shrubs and flowers, and not used as a burying-ground. The eastern precinct, within the gates, consists of a paved court; and on the south, where the apartments of the abbess and her nuns, with due accommodation for father confessors, were situated, is occupied by buildings, among others by the hall in which the sessions for this division of the county are held, and which is given up to the Literary and Scientific Institution upon lecture-nights. Some foundations and other remains of the Abbey existed here till lately; but we believe they are now all cleared away.

The church is, as is usual in complete structures of this kind, in the form of a cross, consisting of a nave and chancel as the stem, and two transepts as the arms, with a massive tower supported upon pillars, and circular arches over the intersection. The length of the nave and chancel is about 240 feet, and the breadth along the transepts more than 120. The whole is very lofty, even in proportion to the extent of the horizontal dimensions. The chancel and

transepts, with the eastern part of the nave, are in the richest style of purely Norman architecture; and the tower is also Norman; but the western part is of a mixed style, inclining to what is usually termed Gothic, with pointed windows divided by mullions, and the great west window consists of three lancet-headed compartments, the central one more lofty than the others, so that they harmonise with a large pointed arch of blind masonry in which they are included. The internal ornaments on the arches of the most ancient part are, generally speaking, zigzags in very bold relief; and the architecture of the whole of this portion is in very fine taste. Though more modern, the western part is inferior, but still it is handsome. The nave has side aisles parted off by pillars; and round the chancel there is an external passage of some width, inferior in height to the interior, but with singularly fantastic sculptures on the capitals of some of the pillars. In this place some of the best monuments are situated, which is in much better taste than if they were in the place devoted to public worship—though there are some there also. The modern communion table is placed upon the high altar, within the doubly enclosed part of the chancel; and here there is a neat modern window of stained glass. The pulpit is considerably in advance of this, so that the voice of the preacher may be alike audible in the transepts and the portion of the nave which is included in the church. The pewage of the whole is modern and very neat. No part of the roof is arched; but the chancel over the communion table has a compartmented ceiling tastefully painted, although the painting is modern, and was executed by an inhabitant of the town. The flooring under the tower, which cuts it off from being a lantern, for which purpose it was perhaps never intended, is also in compartments, and the painting upon it is ancient and faded. The transepts and nave have no ceiling; but the oaken roofs, which do not appear to have been repaired since the first erection, and which stand in no need of repair even now, although plain, are handsome, well contrived, and very substantial. In speaking of the roofs, we may mention that there are upon the sides of the tower cheveron marks, each higher than the other, which indicate the existence of two former roofs, both of which were probably of stone, before the introduction of lead, as even the lowest of the two has a much higher pitch than the present leaden one.

The eastward angles, between the transepts and the chancel, are filled up by two buildings enclosed by arcs of circles, which may at one time have been the chapels or chantries of local saints whose names have now perished with the record; but one of them is now used as a vestry, and the other is a sort of grammar-school, while a Sunday-school is held in a divided portion on the west end of the south aisle of the nave. The tower, which surmounts the intersection of the body and transepts of the church, is accessible by a circular staircase enclosed in the wall at the south-western angle, and consists of 151 stone steps. Near the top of the tower, or rather in a wooden belfry over it, there is a peal of eight bells of the finest tone; and the lead roof surrounding this belfry, and enclosed by a very low parapet, commands a delightful view of the surrounding country. Some years ago there was rather a singular curiosity upon this roof;—it was an apple-tree which grew upon a small portion of mould there, and blossomed and ripened its fruit every year, in the same perfection as if it had been in an orchard. It does not, however, exist at the present time, but whether it was removed by natural decay or by ejectment we are not informed.

There are many architectural peculiarities in the inside of Romsey church which are well worthy of being known; but they are not subjects for the pen, or even for the pencil, except for the most skilful artist. If the interior could be seen from a favourable point of view, the representation of it, looking toward the chancel, would be a treat in ancient architecture; but the division of the length by the screen below the gallery—though a very fine one—and the curtain above the gallery, which is to the full as ugly, defeat the artist in this, and there is no resourse but in geometrical measurements and a perspective projection, which the usual rewards of modern art could not afford. An actual visitor may manage it, because he can shift his eye from point to point, while his memory retains a perfect knowledge of the portion last seen; but as the perspective draughtsman can have no more than one point of sight, a good view of the interior of Romsey church is one of the impossibilities, and therefore, to be fully appreciated, it must be actually visited.

We have left but little space to notice the sculptures and monuments. The former are few, with the exception of the grotesque figures on the capitals of some of the pillars and along the mouldings under the eaves of the nave, together with a very fine representation of the Crucifixion upon the western wall of the south transept, which had once been under the cloisters, in the passage of the nuns from their apartments to a highly ornamented doorway near the angle where this transept joins the south aisle of the nave. Among the monuments the most notable is that of the highly gifted and remarkably successful Sir William Petty, ancestor of the Marquis of Lansdowne, and one knows not whether most to admire the character of the man or the simplicity of the monument. It is a rude stone in the pavement without the chancel, and near the door of the vestry; and the only inscription on it is, "Here leyes Sir William Petty."

EXHIBITIONS OF MECHANICS' INSTITUTES.

Several of the leading Mechanics' Institutes in the country have recently adopted the plan of preparing temporary exhibitions of objects of science and art, pictures, antiquities, natural curiosities, &c., which have been so well managed as to have attracted a large number of visitors. The funds of the institutions have not only been benefited, but a stronger interest has been aroused as to the objects which they are designed to promote. We have received two Reports of Committees appointed to manage the Exhibitions of the Mechanics' Institutes at Sheffield and Leeds; and as a great number of such institutions in other parts of the country might prepare exhibitions of a similar character, we give a short account of the arrangements which were made at the above two places.

At Sheffield, the town and neighbourhood were canvassed by the managers of the proposed exhibition, and it is creditable both to the members of the Mechanics' Institute and to the inhabitants that 436 contributors were found, from whom the loan of 2654 objects and specimens of various kinds were obtained; and the Council of the Literary and Philosophical Society granted the use of their Museum, which was kept open from the commencement to the close of the exhibition. The loans from individuals comprised 1460 specimens of manufactures, models, &c.; 387 oil-paintings, 45 water-colour drawings, 43 pencil drawings, 153 engravings, 46 medallions in wax and plaster, 76 busts and plaster figures, 4 specimens of needlework, 280 specimens of natural history, 140 groups of geological specimens, and 20 cases of entomological specimens. The Music-hall was engaged at a rent of twenty guineas per month. The Report says:—"37,773 persons purchased single admission tickets at 6*d.* each; 1868 bought season-tickets at 2*s.* 6*d.* each; 5907 scholars belonging to Sunday and other free schools were admitted, chiefly at 1*d.* each. The poor inmates of the Sheffield and Brightside Bierlow workhouses, and the boys and girls belonging to the

charity schools, were all admitted gratis. The receipts at the doors, together with profits on confectionary sold, amounted to 1318*l.* 10*s.* 4*d.* The total expenses were 651*l.* 10*s.* 10½*d.*, leaving a balance of 666*l.* 19*s.* 5½*d.* in favour of the institution. The individuals who saw the exhibition, including the repeated visits of those who took season tickets, would scarcely be less than 70,000.

The moral results of such an exhibition are of a valuable kind, and such as to encourage other institutions, and those who may be disposed to assist them, in following the example of Sheffield. The Committee observe:—"First, there is no doubt that the owners of rare and valuable articles possess means of forwarding the moral and mental education of the people; and the contributors to the late exhibition have, by their liberal conduct, done perhaps as much to benefit the working classes of Sheffield as they could possibly have done in any other way. Secondly, your Committee feel convinced that in the present condition of society, scientific and literary instruction will be most effectually given to the people in connection with rational and recreative enjoyments."

At Leeds, we learn from a printed circular addressed to individuals who had lent specimens, that the exhibition had also been highly successful. It was open during three months, and the Committee state that "within that period, 87,908 persons have been admitted at 6*d.* each, and 6220 persons have purchased season-tickets, whose aggregate visits have amounted to 96,005; making a total of admissions of 183,913. Allowing for the repeated visits of persons who have paid the sixpenny admission, not less than 93,500 individuals have enjoyed the high gratification of attending the exhibition. The receipts, inclusive of about 425*l.* proceeding from the sale of catalogues, and of several poetical effusions written for the occasion, and the profits on confectionary, amount to the sum of above 3400*l.*; and, after deducting the ascertained and probable expenses of the exhibition, it is supposed that more than 2000*l* will remain to be appropriated to the object contemplated by its promoters."

Here also the moral effects were very encouraging. The greatest order and decorum were at all times observed; and the Committee state that they cannot but conclude that "the large resort of visitors indicates a growing taste for the contemplation of the works of art and nature, and the study of science; and they feel assured that *that* taste has been materially strengthened by the concentration, in a small space, of so many splendid and beautiful, and, in some instances, rare specimens of each."

TEA-MAKING IN CHINA AND ASSAM.

We apply the term 'tea-making,' in this instance, to the preparation which the leaf of the tea-plant undergoes before it is fit to be made use of as an infusion. Green and black teas, to one or other of which class all the varieties of tea in consumption belong, are not, as generally imagined, the produce of two distinct varieties of the tea-tree, but the distinction is occasioned solely by the different mode in which the leaves are manipulated by the tea-maker. Not only, therefore, may black or green tea be prepared from the same plant, but all the different varieties of each sort.

In the tea-plantations in China the trees are planted in a straight line, three or four feet apart, on small ridges eight inches or a foot in height. When they are three or four years old,—for soil and situation cause some difference as to time,—the leaves may be plucked at the proper season without injury to the plant. If the weather is warm and fine, and the season has not been very cold, the first crop of leaves is plucked in May; the second crop about six or seven weeks afterwards; and a third plucking commences about six weeks after the second is finished. The season therefore lasts from May until after the middle of July. Some plants produce 1¼lb. of leaves in the season; but the average is usually a quarter of a pound for the first crop; the second crop yields rather a smaller quantity; and a third crop is not invariably taken, for fear of injuring the trees.

The quality of teas, whether black or green, depends upon the period of the season when the leaves are plucked. The finest tea is made from the tender and fleshy buds pinched off above the stem. The coarser teas are made from leaves gathered when they are fully grown, the persons employed nipping off, with the fore-finger and the thumb, the fine end of the branch, with about four leaves on it, and sometimes more if they look tender. The circumstances which primarily determine the price of different kinds of tea is therefore evident; but this may be made clearer and the subject of tea-making more completely illustrated by a brief notice of the principal varieties of each class of teas; and we will begin with the Black Teas, as five-sixths of the teas consumed in this country are of this class.

1. Pekoe, a corruption of the Chinese name of Pak-ho ("white down"), consists of the newly developed buds before they have had much time to expand. Black-leaved Pekoe is made from leaves which have been allowed to grow a few days longer. 2. Souchong (in Chinese Seaou-choong, "small or scarce sort") is from the fully-developed leaf when in its tenderest state, and forms the finest sort of the stronger black teas. 3. Congou, the next in quality to Souchong, is called by the Chinese Koong-foo ("labour—assiduity"), and consists of a careful selection of the full-grown leaf before it has become old and coarse. Campoi, a corruption of Kien-poey ("selection—choice") is a superior variety of Congou. 4. The least esteemed tea comes from a district called Bohea, and with us the name is applied to black tea of the lowest quality. Thus, Canton Bohea is a mixture of the commonest Congou with the inferior tea of the province. The leaves are gathered when they have attained their full growth and have become old and coarse, and on this account the Chinese call Bohea Ta-cha ("large tea"). Partly on account of being subjected more to the fire, the infusion is of a darker colour than any other sort of tea; and the manner in which the leaves are gathered will account for the woody fibres it contains.

Green teas of every variety are of a more delicate flavour than the corresponding qualities of black tea. They are less fired, and consequently will not keep quite so well. The following are the principal kinds in use in this country:—1. Young Hyson is made from the earliest gathered leaves of the season, and by the Chinese is called Ya-tsien ("before the rains"). Hyson Pekoe is a superior variety, which is so slightly fired and delicate as not to bear the voyage to Europe. 2. Hyson, from a Chinese name signifying "flourishing spring," is gathered when the leaves are in the course of development, and it is prepared with the greatest care, every leaf being separately twisted and rolled by hand. "Gunpowder" is a selection of the roundest and best rolled Hyson, and is called by the Chinese Choo-cha ("pearl tea"). 3. Hyson-skin is a selection of the coarser leaves of Hyson, as Gunpowder is of the finer; but, though consisting of leaves which are the least twisted or which are in any way of a less fine appearance, Hyson-skin is necessarily a superior description of tea, as the bulk from which it is taken is of the best quality. 4. Twankay is made from older leaves and with less care than any of the preceding, and is therefore the cheapest kind of green tea: of the green teas consumed in England three-fourths are Twankay.

Comparing green teas with black, Twankay and Bohea may be placed in a corresponding scale; Congou corresponds with Hyson-skin, Souchong with Hyson, and Young Hyson with Pekoe.

In the following details the mode described of making Black Tea is that practised at Sudiya, in Upper Assam,

by the Chinese employed under Mr. Bruce, the superintendant of tea culture.

The leaves, being brought to the place where they are to be converted into tea, are thinly scattered in large circular open-worked bamboo baskets, and placed in the frame-work of bamboo represented in *Fig.* 1. Here they are left exposed to the sun for about two hours, or until

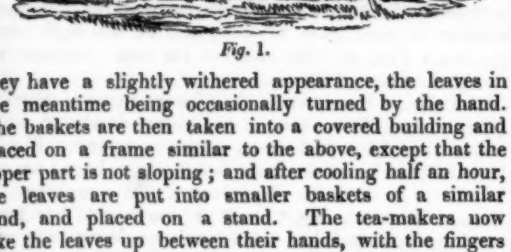


Fig. 1.

they have a slightly withered appearance, the leaves in the meantime being occasionally turned by the hand. The baskets are then taken into a covered building and placed on a frame similar to the above, except that the upper part is not sloping; and after cooling half an hour, the leaves are put into smaller baskets of a similar kind, and placed on a stand. The tea-makers now take the leaves up between their hands, with the fingers and thumb extended, gently tossing them up and down for the space of five or ten minutes. The baskets are again put on the frame for half an hour, when they are again manipulated as before. When this has been done three successive times, the leaves feel something like soft leather.

The next process is "firing." The leaves are put into cast-iron pans fixed in a circular mud fire-place (*Fig.* 2),

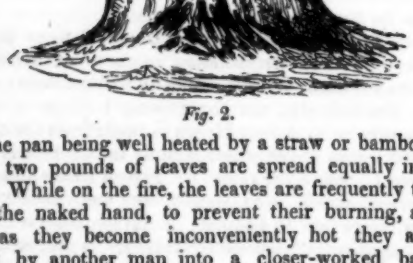


Fig. 2.

and the pan being well heated by a straw or bamboo fire, about two pounds of leaves are spread equally in each pan. While on the fire, the leaves are frequently turned with the naked hand, to prevent their burning, and as soon as they become inconveniently hot they are received by another man into a closer-worked bamboo basket, and taken to a table having a narrow rim round it. The two pounds of hot leaves are divided amongst two or three men, and each forms a ball of the portion of leaves allotted to him, which is grasped gently in the hand, with the thumb and finger extended, as in *Fig.* 3. Some force is used to express any juice

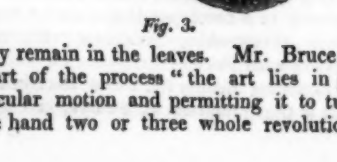


Fig. 3.

which may remain in the leaves. Mr. Bruce says that in this part of the process "the art lies in giving the ball a circular motion and permitting it to turn under and in the hand two or three whole revolutions before the arms are extended to their full length, and drawing the ball of leaves quickly back without leaving a leaf behind." The ball is rolled in this way for about five minutes, during which it is two or three times opened gently with the fingers, lifted as high as the face, and then allowed gently to fall again, to separate the leaves.

The fire is again resorted to; and as soon as the leaves are taken back to the hot pans they are spread out in them as before; also turned with the hand; and when hot taken out and brought again to the table, where the rolling process just described is repeated. The leaves are next put into the drying basket, and spread three or four inches deep in a sieve, in the centre of the basket, and then placed over a glowing charcoal fire free from smoke, a passage being left in the centre of the sieve for the hot air to ascend. As soon as they appear half dried, and while still rather soft, the leaves are taken off the fire, and placed in large open-worked baskets, which are put on the frame, where they remain for some time in order that their colour may be improved.

On the following day the leaves are sorted into large, middling, and small, which form so many different varieties of tea; and each sort is again put in the drying basket, but this time the sieve is only slightly covered with leaves. As quickly as the leaves become crisp with the action of the fire, they are thrown into a large receiving basket. Again, however, they are subjected to the fire, but now they are placed eight or ten inches deep in the sieve, a small passage being left for the hot air as before, and another basket is thrown over the whole to throw back

Fig. 4.

the heat. (*Fig.* 4.) The fire, which was before bright and clear, is deadened; the basket is occasionally taken off and placed on the frame (*Fig.* 5), the leaves gently turned over, and the basket replaced on the fire. Mr. Bruce says that the process is thoroughly completed when the

Fig. 5.

leaves have become so crisp as to break under the slightest pressure of the fingers. The tea is now put into boxes, being first pressed down with the hands and then by the feet, the men engaged having first put on clean stockings.

We do not yet possess minute details of the process of making green tea, which is manufactured in China by a class distinct from the black-tea makers; but it is probable that we shall not be long without information from Assam on this point equally minute as the account from which we have obtained the above details.

In the districts in Assam where the tea-plant grows wild, a very rude mode of preparing the leaves is practised. In the Singpho country the natives pluck the young and tender leaves and dry them a little in the sun, or put them out into the dew and then expose them to the sun for three successive days; or again, others, after a little drying, put the leaves into a heated pan, turning them about until they have become quite hot. They are then put into the hollow of a bamboo, the whole being driven down with a stick, the bamboo being held over the fire until it is full. Some leaves are then tied over the end and the bamboo is hung up in some smoky corner of the hut; and it is said that the tea thus prepared will preserve its properties for many years. Eastward of the Singpho country, a still more singular method of tea-making is adopted. Holes are dug in the earth, and the sides being lined with large leaves of some kind, the tea leaves, after being partially boiled, are put into the hole, which is then covered with earth, and the mass in the interior is allowed to ferment. It is afterwards taken out and filled into bamboos, and in this manner is an article of commerce in Thibet, resembling probably the "tea-cakes" described in No. 484 of the 'Penny Magazine.'

THE HISTORY OF A COAT-BUTTON.

When we say, with reference to an apparently worthless object, that it is "not worth a button," we do not quite know what we are talking about. A button, considered with respect to the manufacturing wealth of the country, is anything but an insignificant article; for the production of the various kinds which are worn by us gives employment to many thousand persons, men, women, and children, in the north of England; and at a time when the legislature was more prone than at present to interfere with the natural progress of trade and manufactures, numerous statutes were made, having for their object the protection and advancement of the button-trade. Strenuous efforts were even made to stem the course of fashion, and to keep the public taste in a path favourable to the early button-makers; but such efforts generally fail in their object.

The ancients do not appear to have used buttons, except a few on the shoulders and arms of women's tunics; or two, connecting the two square pieces of the tunic, near the neck. Among the people and the soldiery, brass buttons frequently fastened a kind of cloak on the right shoulder. They appear to have been used in England, probably more for ornament than use, in the tenth century: gold or silver was generally the material of which they were made, and they were of foreign manufacture.

As to the materials of which buttons have been made in more recent times, they are almost innumerable; but among them are gold, silver, plated copper, white metal, pinchbeck, steel, japanned tin, glass, foil-stones, mother-of-pearl, ivory, bone, horn, tortoiseshell, jet, cannel coal, paper, leather, &c., exclusive of those buttons which consist of a mould of wood or bone, covered with mohair, cloth, thread, or some similar substance. We will take a rapid glance at the modes of manufacturing some of these kinds of buttons.

Those which are called *covered* buttons have generally a central piece of flat horn or bone called a *mould*. These moulds are small circles, perforated in the centre, and made from those refuse chips of bone which are too small for other purposes. For large or coarse buttons, these moulds are generally made of wood; but whether bone or wood, they are formed as follows:—the material is sawn into thin and equal flakes, from which the moulds are cut out by an operation which, at the same time, makes a perforation through the centre. A lathe is provided with a cutting tool having three projecting points. A girl places a flake of bone or wood in a position where the tool can act upon it, and, by the rotation of the tool, the two outer points cut out the circular mould, while the central point perforates through it. While this is doing, the surface of the mould is worked smooth by the parts of the tool intermediate between the points. When a mould is thus made, it is dropped into a box beneath, and the girl exposes a new part of the slip of horn to the action of the instrument. A girl, ten or twelve years of age, is enabled to cut out twenty or thirty button-moulds per minute in this manner. The fragments, sawdust, &c., are all sold for manure, &c., so that not a particle of bone is lost. If wood be employed, it is generally oak, beech, or elder, dyed black with nut-galls or some similar dye.

These button-moulds were formerly covered with threads of gold, silver, silk, and other costly materials. Several women sat round a table, each having a large needle fixed in the table opposite the part where she was seated, and also a bobbin or reel, containing the thread which she was to use. The mould was held by the hole in its centre upon the needle, and the end of the golden or other thread was at the same time put through the hole and fixed. The thread was then wound over and round every part of the mould in a peculiar way, so as everywhere to present a surface of thread, and also a determinate pattern, according to the fashion of the day. When this was effected, the end of the thread was secured; and, at the back of the button, a number of the folds of thread were taken up and tied together, so as to form a kind of shank for fixing the button to the garment.

Such was the kind of button worn in England for a long period, and their manufacture employed a very large number of persons, chiefly aged females and children, who covered the moulds with threads of various kinds. When the fashion arose of covering the moulds with the same cloth as the garment was made of, a great outcry arose, and a petition was presented to parliament, of which the following is a part:—"It appears by long experience that needle-wrought buttons have been a manufacture of considerable importance to the welfare of this kingdom, insomuch that whenever such buttons have been disused, the wisdom of the nation hath always interposed, as may be seen by the several acts passed in the reigns of King William, Queen Anne, and of his Majesty in this present parliament. Yet, notwithstanding the said acts, the tailors continue to make buttons and button-holes of the same materials the cloths are made of; and the said acts cannot be put in execution, because of the great difficulties that attend the detecting and prosecuting the offenders." The petitioners then pray for some additional protection, but with little success, for tyrant fashion little respects acts of parliament on these subjects. Very little has been known of these needle-wrought buttons within the last half century, for more speedily-executed plans were sought for.

For common wear, *horn buttons*, without any covering, have been much employed. These are made both with and without shanks, those without shanks having four holes, by which they may be attached to the garments. These last-named horn buttons are made concave in front, to preserve the thread by which they are sewed: they are made as follows:—cow-hoofs are boiled in water till they become soft, and are then cut into parallel slips by a cutting-knife or blade, which acts as a lever by having a hinge at one end. These slips, which are of the width of the diameter of the button, are then cross-cut into small squares, and the angles cut off. The pieces are dyed black by being immersed in a cauldron containing a solution of logwood and copperas, and then dried. A mould is formed, something like a pair of pincers, each half having six or eight small steel dies fastened to it, each die containing the impression of the intended button embossed upon it. When shut close, the opposite dies

exactly correspond, and represent the entire shape of the button. The mould being heated somewhat above the temperature of boiling water, a piece of horn is placed upon each impression in it, and the mould is then closed and confined within a powerful press or vice. The united action of the heat and of the pressure forces the pieces of horn to take the exact impression of the two halves of the dies, and they come out in the form of buttons, plain or embossed, as the case may be, but with their outer edge a little ragged: this roughness is removed by filing, the button being held in a lathe.

If the horn button thus made is to have no shank, four or five holes are drilled through it by an ingeniously-constructed lathe; but if shanks are required, these must be firmly united to the horn. The shanks are made in a curious manner. Brass or iron wire is wrapped spirally round a steel bar by the rotation of the bar in a lathe. The coil is then slipped off the bar, forced into a somewhat oval form, and cut through its whole length, so that each turn of the coil produces a button-shank of an oval form, with two disengaged ends. More recently an elegant little machine has been invented, which, by the simple turning of a winch, supplies itself with wire from a reel, and delivers it, cut and bent, to the proper figure of the shank: each turn of the winch forms a shank. Shanks such as these are inserted in the horn buttons by children, who, previous to the pressing in the mould, drill a hole in each button-piece, and insert the shank. The mould has a cavity for receiving the shank, and the pressure closes the horn about it so effectually, that it will not come out. Sometimes horn buttons are made plain, and then have a pleasing device made upon them by placing on their surface a thin plate with a pattern cut in it: by rubbing over the plate with emery-powder, the horn will become scratched or deadened through the holes in the plate, but left polished at the other parts.

Metal Buttons are used to an enormous extent, though at present, perhaps, not so much as they were twenty years ago. They are made in two ways, either by *casting* or by *stamping*, the latter of which is the most general. The casting of buttons is thus effected: a considerable number, from fifty to a hundred and fifty, of buttons of any desired pattern are ranged near each other, and connected by little bits of metal. An impression from this collected pattern is made in sand, by pressing the button evenly on a very smooth sandy surface; by this means every button makes a mould, exactly the same size, form, and pattern as itself. A shank is then pressed into the sand in the centre of each impression, the part which is to enter the metal being left projecting above the surface of the sand. The buttons are now cast, from whatever metal may be chosen for that purpose; brass, pewter, tin, and zinc, used either singly, or combined two or three together, are the usual materials for such buttons, the zinc being used chiefly to enable the other metals to flow more readily into the moulds. When the buttons cast from the melted metal are cold, they are cleaned from the sand by brushing; they are then broken asunder, and each button carried to a second workman at the lathe, who, after having retained it firmly by means of the shank, carefully files the circumference, by which he reduces it to a true circle. By removing the button to another lathe, the back and face are smoothed and rendered even by tools fitted for the purpose. The buttons are then polished, by fixing the shanks in a piece of board, and rubbing the faces on another board covered with leather and strewed with rotten-stone and oil. The last polish is given by applying the button lightly to the edge of a wheel covered with soft leather, and dressed with very fine powder of rotten-stone. Sometimes buttons of this kind are rendered white, somewhat resembling silver. To produce this effect, melted tin is poured into cold water, and by this means granulated. A quantity of cream of tartar, diluted with water, is put into a boiler, and the tin added to it; the boiling causes part of the tin to be dissolved; and the buttons being let down into the liquor upon a wire grating, part of the tin attaches itself to the metal buttons, rendering them white, and preserving their former polish. This method of washing with tin produces a white colour which remains for a considerable period.

But the *gilt button* is the most interesting result of this manufacture. Here there is no casting. The button is stamped out from copper, slightly alloyed with zinc, and laminated in a flatting-mill to the proper thickness. The stamp is moved by a fly-press, which cuts out circular pieces, called *blanks*, at one stroke. These blanks are annealed in a furnace, to soften them, and the maker's name, &c., is struck on the back by another stamp.

Into the blanks thus made, the shanks are fixed. A shank is placed upon each blank, and held down upon it by a sort of spring tweezers. A small quantity of spelter and borax is placed round each shank, and ten or twelve dozen in this state are introduced, upon a large iron shovel, or peel, into an oven, heated sufficiently to fuse the solder. When this is effected, the shanks are found to be firmly united to the blanks. The edge of each button is then turned smooth in a lathe, and a number of buttons are dipped into a *pickle* of dilute nitric acid, to cleanse their surfaces. Each button is then burnished with a hard black stone, called blood-stone, fixed into a handle, and applied to the button as it revolves by the motion of a lathe; the stone employed is a peculiar kind of iron-ore, found at many places in Derbyshire.

The buttons are now in the state to be covered with a thin film of gold. The gold, mixed with mercury, is placed in an iron ladle, and heated until they are perfectly united. This amalgam of gold is put in an earthen pan, and a quantity of dilute nitric acid being poured in, the buttons are introduced, and stirred about in the mixture by means of a brush. The chemical nature of what ensues is curious; for the acid acts as an agent for spreading the amalgam over the surface of the copper button, and the mercury of the amalgam acts as the agent by which the gold, the other ingredient of the amalgam, is permanently fixed on the copper; neither the acid nor the mercury are of use except as agents, as means to an end. Consequently, when the process which we have just described, and which is called *quicking*, is completed, the nitric acid is washed off by means of clean water; and subsequently the mercury is also driven off, but by the aid of heat instead of water. The processes connected with the driving off of the mercury, as well as some details respecting the extraordinary thinness of the film of gold left upon the button, will be found in a paper on the "Divisibility of Gold in Manufactures" ('Penny Magazine,' vol. i., p. 402). We will therefore here only observe, that after the mercury is removed, the button is brilliantly polished.

Plated buttons are made from plates of copper, to one side of which a thin sheet of silver has been attached by the powerful pressure of the flatting-mill. The blanks are cut out of this sheet by a stamp, as in the gilt button, and the shank is fixed to it with silver solder, and with the aid of a blow-pipe, for the heat of an oven applied to the whole button would endanger the silver. The washing in nitric acid, the burnishing, &c., are applied as in the last instance, but neither mercury nor gold is employed.

Cup buttons, either plated or gilt, are made of two pieces, viz. a common flat button with a shank, and a small hemisphere fixed on in front. These hemispheres are punched out by the fly-press, and then the inside is turned in a lathe, to receive the edge of the plain button, made as before described. When put in its place, the edge of the cup is burnished down over it to hold it fast. These buttons are afterwards gilt and burnished in the same manner as plain ones.

It must be evident, that most of the materials for buttons which we have enumerated, may be manufactured in one or other of the few modes we have pointed out; and we need not therefore extend this paper to dwell on them. We will state one or two circumstances illustrative of the extent of the button-trade. Previous to the year 1815, upwards of one thousand persons were employed in Birmingham in the making of fancy white metal buttons, cut by an engine; it was a cheap showy article, and almost the entire produce of the numerous hands employed was sent to the Continent. A single artisan, well acquainted with the processes of the manufacture, happening to be detained by Bonaparte, stated to the French government his ability to establish a workshop and produce the button. He was immediately patronised; the trade presently left Birmingham, and France supplied the markets of Europe. Another kind, called the "Bath metal drilled shank button," of which 20,000 gross were made at Birmingham per week, at one period, was lost in a similar manner. In speaking of buttons, Mr. Hutton says: "In some branches of traffic, the wearer calls loudly for new fashions; but in this, the fashions tread upon each other, and crowd upon the wearer. The consumption of this article is astonishing, and the value, in 1781, was from three pence to 140 guineas per gross." In 1818, the art of gilding buttons had arrived at such a degree of refinement in Birmingham, that three pennyworth of gold was made to cover a gross of buttons; these were sold at a price proportionally low. The experiment has been tried to produce *gilt* buttons *without any gold;* but it was found not to answer, the manufacturer losing more through the decreased demand than he saved in the material.

ON CORAL AND THE CORAL FISHERY.

Coral is one of those many substances which for a long period baffled the attempts of naturalists to account for their origin. Growing as it does beneath the surface of the water, and presenting some indications of an organised structure, many early observers considered it to be either an animal or a plant; while on the other hand, the hard stony texture which coral presents induced many to class it among mineral productions. It presents the appearance of a kind of shrub growing beneath the water, and has, at the surface of its branches, certain organised structures, which were at one time considered to be flowers, but which are now known to be animals. There are a great number of organised structures which bear this character; but we shall here confine ourselves to one single species of them all, viz. that one known as *red coral*.

Red coral was known in early antiquity; and the Greeks, in calling it *korallion* (from two Greek words signifying to *ornament* and *sea*), merely expressed their admiration of it as a beautiful marine production; but the most erroneous opinions were expressed concerning its nature. Theophrastus makes mention of it as a precious stone. Pliny speaks of it in his 'Natural History,' as well as of the places whence the fishers procured it: he also alludes to the medicinal properties that were then attributed to it, and to the employment of it as an article of luxury. In his time the Indians had the same passion for grains of coral that the Europeans have since had for pearls. The soothsayers and diviners considered these grains as amulets, and wore them as being ornaments agreeable to the gods. The ancient Gauls ornamented their bucklers and helmets with this brilliant production. The Romans placed pieces of coral on the cradles of newborn infants, to preserve them from the maladies incident to infancy; and their physicians prescribed divers preparations of coral to invalids attacked with fevers, fainting, ophthalmia, and many other complaints.

During the state of barbarism into which Europe was plunged after the fall of Rome, few persons seem to have made any investigations into the nature of coral: it shared the fate of most other departments of natural history: the monks were the possessors of nearly all the knowledge of science then existing, and the closet of the student is not the place in which to study natural history. There does not appear any notice of coral for several centuries in the writings of the few authors who have been handed down to us. Guysonius, a writer of the fifteenth century, seems to be among the first of the moderns who mention coral, and he classes it among mineral productions. This opinion was then adopted by Boccone; but subsequent observation induced him to give it a place among animal bodies. Tournefort, whose enthusiastic love of botany induced him to rank as a plant every organised substance whose nature was doubtful, considered coral to belong to the vegetable kingdom. At length, about the year 1720, M. Peyssounel, of Marseilles, announced a discovery, the correctness of which has been since fully confirmed, that the coral is an animal of the *Polypus* tribe. Since that period two names have been employed, viz. *lithophytes* and *zoophytes*, to denote these animals, the first implying *stone-plants*, and the second *animal-plants*, arising probably from the strong resemblance which it bears to all three kingdoms; but modern naturalists have agreed in the use of the term *zoophytes*.

The reader must, however, bear in mind that the pieces of red substance which we call *coral* are not, and never have been, really animals: they have once constituted a kind of *bone* or *skeleton*, by which the living insects were supported. Many similes have been used to exemplify the nature of coral: some say that it bears the same relation to the coral-insect that a skeleton does to the human being; some say that the relation is equivalent to that between an oyster and its shell, or a snail and its shell; while others consider coral a sort of nest for the insect; but the analogy is not strict in any of these cases: without instituting a comparison, therefore, between coral and any other organised body, we will proceed briefly to explain the views of modern naturalists respecting the formation of this substance.

"When a branch of living coral," says Poiret, "is drawn up from the sea, it presents a kind of bark spotted with little round tubercles, and covered with a thick adhesive humour, which appears to flow particularly from the summit of the branches, where may be seen large milk-like drops. Plunged again into the water, these tubercles expand, blow, and spread out a star-like substance with eight rays or arms, which M. de Marsigli, and after him many others, seduced by appearances, took for the *flowers* of coral. More recent experiments have demonstrated that these so-called flowers are really animals, armed polypi, lodged in cells situated at the summits and along the sides of the branches." Now it is supposed that this adhesive humour is the material from whence the bark or skin of the branches is formed; and further, that when this bark becomes solidified by age, it hardens into a central core, which then forms the stone-like substance which we call coral. It is in a way somewhat analogous to this that the wood of trees is formed. Each year's growth adds an *external* coating to the substance of the trunk beneath the bark: this coating is comparatively soft; but simultaneously with its formation, an *inner* coating of the same substance is gradually hardening into true wood.

Whatever be the age or the size of a living coral branch, it is always found that there is an inner substance, hard, compact, and capable of receiving a polish; and an outer substance, soft, spongy, thin, and which soon dries when exposed to the air. It is in this spongy bark that are found numbers of little soft whitish polypi, inhabiting small cells. The extremities of the branch are small and tender, and contain very little of the interior substance, all of which is exactly consistent with the

formation of the central coral from successive layers of the viscous humour. The animals are found to possess minute glands, in which is secreted this viscid humour, a humour composed of animal gluten, calcareous earth, and some other substances. Poiret, who paid great attention to the growth of coral off the coast of Barbary, offers a conjecture that this humour may contain the eggs of polypi; and that these eggs either attach themselves to foreign substances, and there form new generations, or they remain fixed upon the paternal branch, grow up into polypi, and live and die there. He proceeds:—"The polypus dies; but in dying it is not, like most animals, submitted to a dissolution which makes it an object of corruption. The death of a polypus is a kind of ossification. It becomes dried and hardened, and remains attached to the branch whence it acquired birth. It appears easy after that to conceive how the coral can insensibly form branches of great extent by layers, both horizontal and perpendicular, of dried and hardened polypi. . . . This matter is augmented by the abundant secretions of the living polypi, and by their envelopes, that is, the cells which they have formed, which, piled one on another, enlarge the branches and form new ones."* Poiret sums up his remarks by saying that a coral is neither an animal, a plant, nor a mineral; but an animal production, the metamorphosis of millions of polypi.

The red coral of which trinkets are made is found in considerable quantities in the Mediterranean, particularly off the coast of Barbary, near Sicily, and off the southern coast of France. It is not found attached to sandy or muddy bottoms, since it always requires a firm rocky bed to adhere to. It springs principally from the inclined sides of submarine rocks, where it shoots forth in the form of a shrub, seldom more than a foot or eighteen inches in length. This coral shrub has a trunk and branches, which vary considerably in diameter, but are still very small. The trunk or principal stem attaches itself so firmly to the rock, that considerable force is required to remove it; and as it is situated far below the surface of the sea, the fishery, or gathering of the coral, is a somewhat laborious employment. This is one of those rude occupations which are conducted nearly in the same manner in all times and in all countries; and Spallanzani's description of the coral fishery in Sicily will pretty nearly represent the present modes of proceeding, both there and elsewhere.

The instrument with which the branches of coral are forced from the rocks is formed with two pieces of wood, crossing each other at right angles, and having a piece of net fastened on the under side to their extremities. A large stone is fixed where the poles intersect each other, that the instrument may more readily sink to the bottom. A cord is strongly tied round the middle of it, one end of which the fisherman holds in his hand, guiding thereby the net to those places where the coral is supposed to grow: the branches of coral are then made to entangle among the meshes of the net, are broken off, and drawn up. This fishery is carried on from the entrance of the Faro to a part of the Strait of Messina, six miles distance. The rocks which produce the coral are situated almost in the middle of the strait, at depths varying from 350 to 650 feet. The bottoms and caverns of the rocks are the places from whence the fishermen endeavour to bring up the coral with their nets. The fishermen have divided the whole tract in which they fish into ten parts. Every year they fish only in one of those parts, from a notion that ten years is necessary to the full growth and perfection of the coral; they say that when they transgress this law, they find the coral smaller and of less consistence, and the intensity of the colour to be proportionate to the number of years they have desisted from fishing.

* Poiret, 'Voyage en Barbarie.

The coral is generally observed to grow perpendicular to the plane on which it grows, whatever be the position of that plane.

The number of boats employed in the coral fishery off Sicily is said to be about twenty, and the season is from April to July. Each boat is managed by eight men; and the quantity of coral procured is estimated at twelve Sicilian quintals of two hundred and fifty pounds each. The gain acquired is considered adequate to the labour; but the fishery is still only a secondary consideration, since the fishermen only follow it when they have no other employment by which they can make a greater profit. In the coral fishery established off the coast of Barbary, the arrangements were, and we believe still are, as follows:—seven or eight men go in a boat, commanded by the proprietor: the caster throws the machine or net, while the other six manage the boat. The net nearly resembles those used at Sicily, except that two different kinds are employed, one for fishing up the coral where the bottom is smooth, and the other so constructed as to be employed where the bottom of the sea is rocky and unequal. When the fishery is over, the produce is divided into thirteen parts, of which the master-coraller takes four, the caster two, one to each of his six companions, and one for the agents or dealers on shore.

When the coral has been brought on shore, it is separated into different qualities, and devoted to the preparation of necklaces, ear-rings, and other well-known trinkets. The quantity of these worn in Europe is much smaller than those belonging to the Arab and other semi-barbarous people. A great quantity of coral ornaments are manufactured at Marseille, and exported from thence to different ports on the south and east of the Mediterranean, where a ready sale is found for them. With respect to the mode of manufacturing ornaments from a branch of coral, we need merely say that coral, like gems, and many crystalline substances, is cut or ground upon a wheel with the aid of some hard but fine powder: in most of such cases the surface of the wheel is softer and the powder employed is harder than the body which is to be cut.

There are but few things possessing commercial value of which the price varies so greatly as coral. It is stated in Macculloch's 'Commercial Dictionary,' that coral is sold as low as one shilling per pound, and as high as ten guineas per ounce, the latter of which is more than double the price of pure gold. This difference of price results from differences in dimensions, in colour, in compactness, in smoothness, and other qualities. The high price of the best coral has led, as in most similar instances, to the production of a counterfeit coral. This is made of well-beaten cinnabar, a layer of which is applied on a piece of wood, well-dried and polished, first moistened with size, and afterwards varnished with white of egg. This, however, is only one of the various modes in which a rough imitation of coral may be produced.

In this paper we have confined our attention to the comparatively small patches of coral found in the Mediterranean, and used by us for the production of ornaments. The huge coral rocks, reefs, and islands of the Pacific and Indian oceans form a geological phenomenon of too great importance to be adequately noticed in an article like the present.

Genius Uncultivated.—The richest genius, like the most fertile soil, when uncultivated, shoots up into the rankest weeds; and instead of vines and olives for the pleasure and use of man, produces to its slothful owner the most abundant crop of poisons.—*Hume's Essays.*

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.

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